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## APPENDIX A

**RIVER CITY WRAPS STAKEHOLDER SURVEY DATA**  
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## APPENDIX B

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## EXECUTIVE SUMMARY

The River City WRAPS project is part of a coordinated effort by the City of Wichita as well as other federal, state, local agencies and private sector organizations to develop a watershed restoration and protection strategy for the portion of the Middle-Arkansas-Slate sub-watershed within the Wichita Environs. The River City WRAPS watershed is generally defined by the limits of the City of Wichita, and includes a relatively small portion of the Middle Arkansas-Slate Watershed. The lower reaches of the Gar Peace Watershed and the Little Arkansas Watershed extend into the River City WRAPS watershed area. The River City WRAPS area accounts for the majority of the urban land use within the watershed. In the urban area of Wichita, surface runoff potential is greatly increased by the higher percentage of impervious surface area associated with urban commercial and residential development.

Important sub-watersheds within the River City WRAPS area and their hydrologic unit codes (HUC) are:

- Gypsum Creek (HUC 110300130101);
- Headwaters Cowskin Creek (HUC 110300130102);
- Cadillac Lake/Cowskin (HUC 110300130103);
- Dry Creek-Cowskin Creek (HUC 110300130104);
- Wichita Floodway (HUC 110300120105);
- Wichita Valley Center Floodway-Arkansas River (HUC 110300130106);
- Chisholm Creek-Little Arkansas (HUC 1103001205); and,
- Big Slough-Arkansas River (HUC 1103001002)

Designated uses for the watershed include primary contact recreation, domestic water supply, food procurement, groundwater recharge, industrial water supply, irrigation and livestock watering. According to the Watershed Conditions Report for HUC 8 11030013 (KDHE Non-point Source Section, 11/28/00), Surface water quality for Middle Arkansas-Slate streams and rivers is generally fair with less than half of surface water bodies not supporting their designated uses.

Based on available information, public response to surveys and SLT discussion and knowledge, the following water quality impairments are targeted for action by the River City WRAPS program. Listed in order of priority, these impairments include:

1. Bacteria
2. Nitrate and phosphorus (nutrient loading)
3. Sediment loading
4. Pollutants associated with sediments (i.e. pesticide, fertilizers, and metals).

A number of TMDLs have been established for the watersheds within the River City WRAPS area. These TMDLs and their respective priority for implementation are:

- High implementation priority TMDLs;
  - Arkansas River below Wichita, Bacteria
  - Cowskin Creek, Biological
  - Cowskin Creek, Bacteria.

- Medium implementation priority TMDLs;
  - Arkansas River below Wichita, Biological
  - Arkansas River below Wichita, Chloride
- Low implementation priority TMDLs;
  - Arkansas River below Wichita, Chlordane
  - Arkansas River at Wichita, Chlordane

Horseshoe Lake and Kids Pond, Sedgwick County Park, are assigned low priority TMDLs for eutrophication.

The established goal of the WRAPS project is to meet water quality standards for the following watershed designated uses.

- Secondary Contact Recreation and Expected Aquatic Life Support - all watershed stem segments
- Primary Contact Recreation, Domestic Water Supply, Food Procurement, Groundwater Recharge, Industrial Water Supply Use, Irrigation Use, and Livestock Watering Use - main stem watershed segments.

The WRAPS project proposes to meet applicable designated use water quality by achieving established TMDLs for Fecal Coliform Bacteria, Biological / Nutrient Loads, Sediment Loading and other pollutants. The SLT has determined that the following actions will provide the most effective approach to achieving established TMDLs.

- Implementation of effective information/educational programs with the goal of increasing public awareness and participation.
- Implementation of effective best management practices (BMPs) to reduce surface water run-off.
- Implementation of effective BMPs to improve surface water run-off quality and reduce erosion and sediment loading.
- Implementation of projects and initiatives directed at improving recreational opportunities and aesthetic values along rivers and streams in the watershed.

This report describes River City WRAPS development phase activities and provides an outline of proposed WRAPS assessment and planning phase actions.

**1.0 WRAPS LEADERSHIP TEAM****1.1 SLT MEMBERSHIP LIST**

<b>Name</b>		<b>Affiliation</b>
Bill	Adsit	Boeing
Kim	Austin	Terracon
Ted	Barnet	Via Christi Health
Richard	Basore	KDHE
Dane	Baxa	EARTH/Waterlink
Tonya	Bronleewe	Sedgwick County Extension
Darren	Brown	CDM
Jane	Byrnes	Citizen
Kathy	Dittmer	WIN - Riverside Citizens
Larry	Emley	Fairfax Neighborhood Assoc.
Sharon	Fearey	Historic Midtown
Bruce	Fuelling	Sierra Club
Debora	Gafvert	Sierra Club
Bryan	Griffin	CNH
Dallas	Grothesen	Huntleigh HOA
Hoyt	Hillman	Wichita Metropolitan Area Planning
DeEtte	Huffman	Arkansas River Coalition
Russell	Johnson	Citizen
Drew	Jordan	WDM
Tom	Kneil	Sierra Club (SLT Executive Committee Member)
Dani	Leite	GHS/EARTH
Rebecca	Lewis	City of Wichita Environmental Health (SLT Executive Committee Member)
Scott	Lindebak	City of Wichita Stormwater Management
Brian	Nelson	District 3 - USD239 / DAB 3 (SLT Executive Committee Member)
Mike	Pontius	Citizen
David	Robbins	Citizen
Rachel	Schober	Historic Midtown
Natalie	Snyder	City of Wichita Environmental Health
Dylon	Storey	Citizen (SLT Executive Committee Member)
Maurice	Terrebonne	City of Wichita Environmental Health
Curt	Van Boening	Audubon (SLT Executive Committee Member )
Vaughn	Weaver	Citizen (SLT Executive Committee Member)
Max	Weddle	Citizen
Jason	Wenice	Citizen
Susan	Wolcott	Arkansas River Coalition

## 1.2 RIVER CITY WRAPS SPONSORS

The City of Wichita, Kansas has agreed to serve as the sponsoring agency for the River City WRAPS project. A memorandum of agreement defines the responsibilities of the sponsoring agency.

## 1.3 VISION STATEMENT

River City WRAPS vision is to improve and protect the water quality of the Lower Arkansas River and its watershed through appropriate sustainable practices, community involvement, and education so that water quality becomes a valued component of life in South Central Kansas.

## 1.4 MISSION STATEMENT

River City WRAPS mission is to develop and implement water quality improvement projects in the community that restore and protect the overall health of the river's watershed ecosystem. In addition, River City WRAPS seeks to educate the public on the importance of water quality and best management practices each citizen and local entities can participate in to help protect the river well into the future.

## 1.5 COMMUNITY OUTREACH

The River City WRAPS community outreach campaign began Aug. 7 with a city-issued press release to local media outlets and the launch of a multi-page Web site, [www.rivercitywraps.org](http://www.rivercitywraps.org), on Aug. 12. Within the first week, River City WRAPS received coverage on two radio stations and numerous mentions on environmentally-related blogs. River City WRAPS was also featured on the front page of the Wichita Eagle a few weeks later. The story brought attention to storm water runoff and directed readers to the River City WRAPS Web site where they could fill out a survey about water quality improvement.

The purpose of the survey was to not only provide stakeholders with the opportunity to indicate their interest in serving on the Stakeholder Leadership Team (SLT), but also to provide valuable feedback about the general public's watershed perceptions. SLT membership was not limited. Anyone who indicated they had an interest in serving on the SLT was contacted and encouraged to participate.

To date, 190 surveys have been completed. When asked if they were interested in serving on the SLT, 30 people said they were interested, 76 said they were not interested and 83 said they needed more information before making a decision. **Figure 1** and **Figure 2** represent the diverse group of stakeholders who completed the survey. See **Appendix A** for the complete survey summary results.

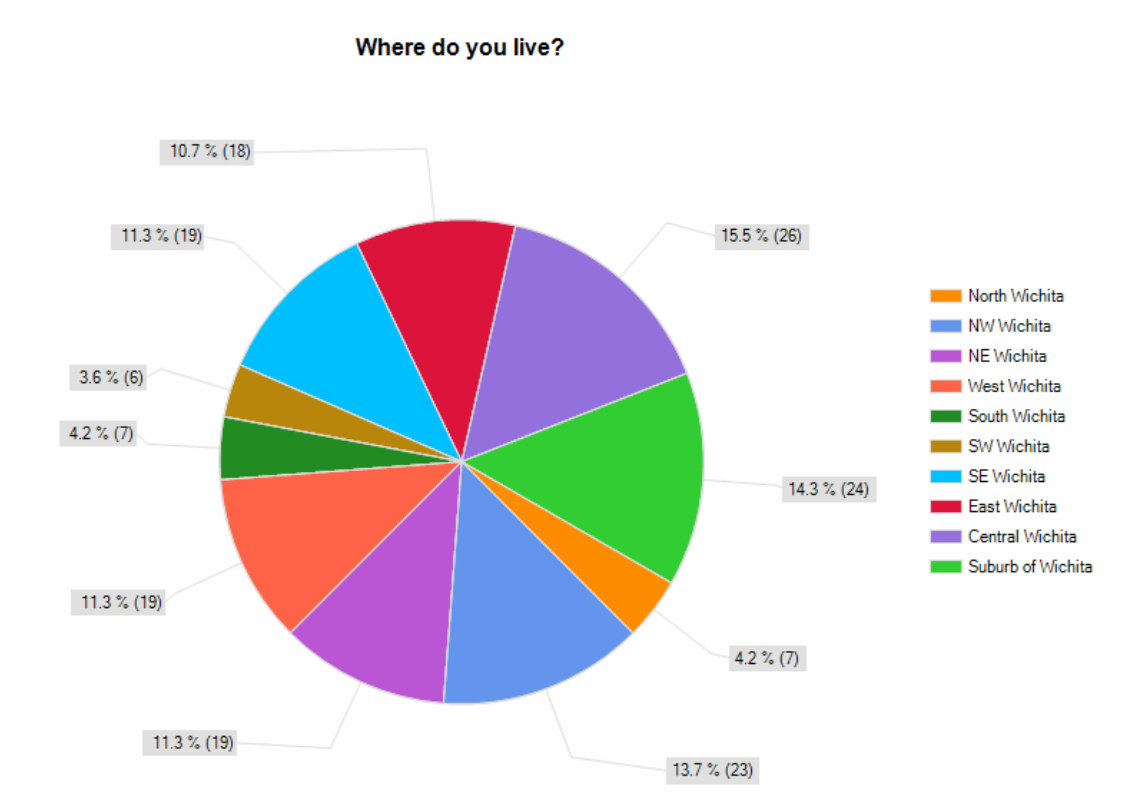


Figure 1: Survey Question – Location

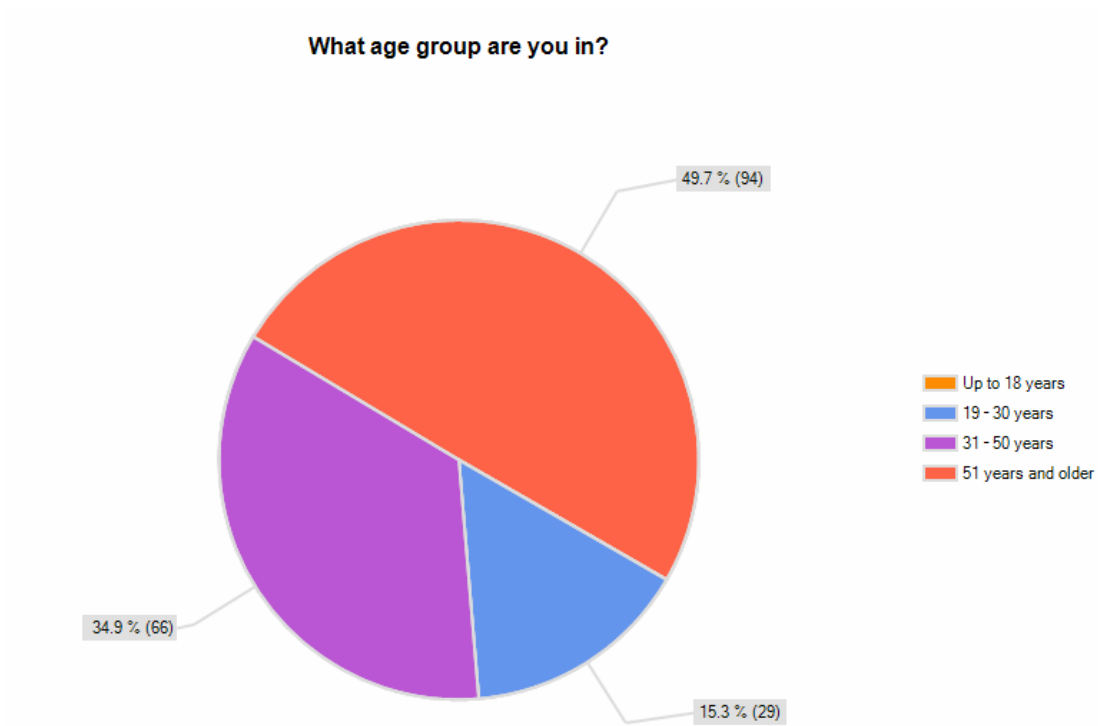


Figure 2: Survey Question - Age

To accommodate stakeholders with and without access to the Internet, survey participants were given the option of filling out the survey by hand or online. One of the ways the development team acquired handwritten surveys was through community meetings. Three public meetings were held at various locations across Wichita between Sept. 29 and Oct. 20. River City WRAPS team members also presented to each of the City of Wichita's District Advisory Boards as well as to interested groups and organizations.

Additional presentations included groups such as the Hispanic Chamber of Commerce, Young Professionals of Wichita, the Sierra Club, Wichita Audubon Society, Ark River Coalition, Wichita Independent Business Association and the American Society of Civil Engineers. See **Appendix A** for a complete list of organizations.

## 1.6 STAKEHOLDER IDENTIFICATION

The River City WRAPS Development Team began its initial outreach with a list of more than 700 stakeholders. The list was created from in-depth online research and included members from homeowners' associations, non-profit organizations, school districts, government agencies and area businesses. See **Appendix A** for a complete list of stakeholder names.

Stakeholder communication was predominately handled through the River City WRAPS Web site and a series of e-mail newsletters that went out on a regular basis. Information about the process as well as instructions on how to get involved were posted on the Web site and frequently updated throughout the development phase.

The River City WRAPS Web site received visits from users all across the county. Below is a brief Web site summary. See **Appendix A** for the full site report.

Web Site Analysis:

### Visitors

Date	Visitors
August, 2009	148
September, 2009	224
October, 2009	177
November, 2009	176
December, 2009	159
January, 2010	161
February, 2010	118
<b>Total</b>	<b>1,163</b>

Date	Hits
August, 2009	2,450
September, 2009	3,326
October, 2009	3,124

Date	Visitors
November, 2009	1,858
December, 2009	2,853
January, 2010	2,087
February, 2010	1,357
<b>Total</b>	<b>17,055</b>

## 2.0 WATERSHED SUMMARY

The Arkansas River begins high in the Rocky Mountains near Leadville, Colorado. It descends the eastern slope of the Continental Divide as a clear mountain stream and flows through the flat agricultural lands of southeastern Colorado and western and central Kansas. The Little Arkansas is a major tributary of the Arkansas River, and originates approximately 75 miles northwest of Wichita. The Little Arkansas flows southeasterly for about 90 river miles to its confluence with the Arkansas River at Wichita. Within the Wichita-Sedgwick County area, both rivers are sandy, meandering streams.

This WRAPS project is part of a coordinated effort by the City of Wichita as well as other federal, state, local agencies and private sector organizations to develop a watershed restoration and protection strategy for the portion of the Middle-Arkansas-Slate sub-watershed within the Wichita Environs.

Figure 3 shows the geographic extent of the Lower Arkansas Basin in south central Kansas. Figure 4, on the following page shows the geographic extent of the Middle Arkansas-Slate Watershed.

The 8 digit hydrologic unit code (HUC 8) for the Middle Arkansas-Slate Watershed is 11030013.

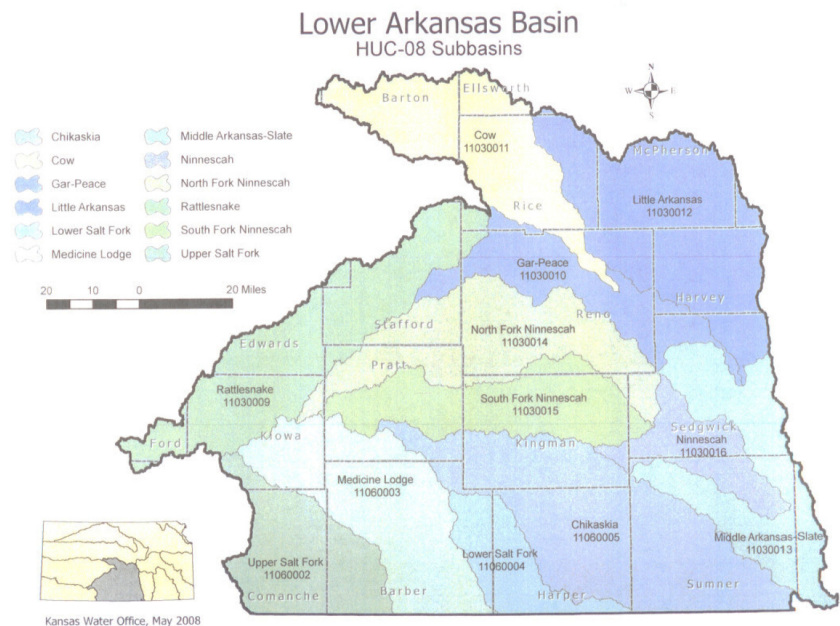


Figure 3: Lower Arkansas Basin  
Kansas Water Office, May 2008



## Huc -11030013- Middle Arkansas Slate Watershed Boundary

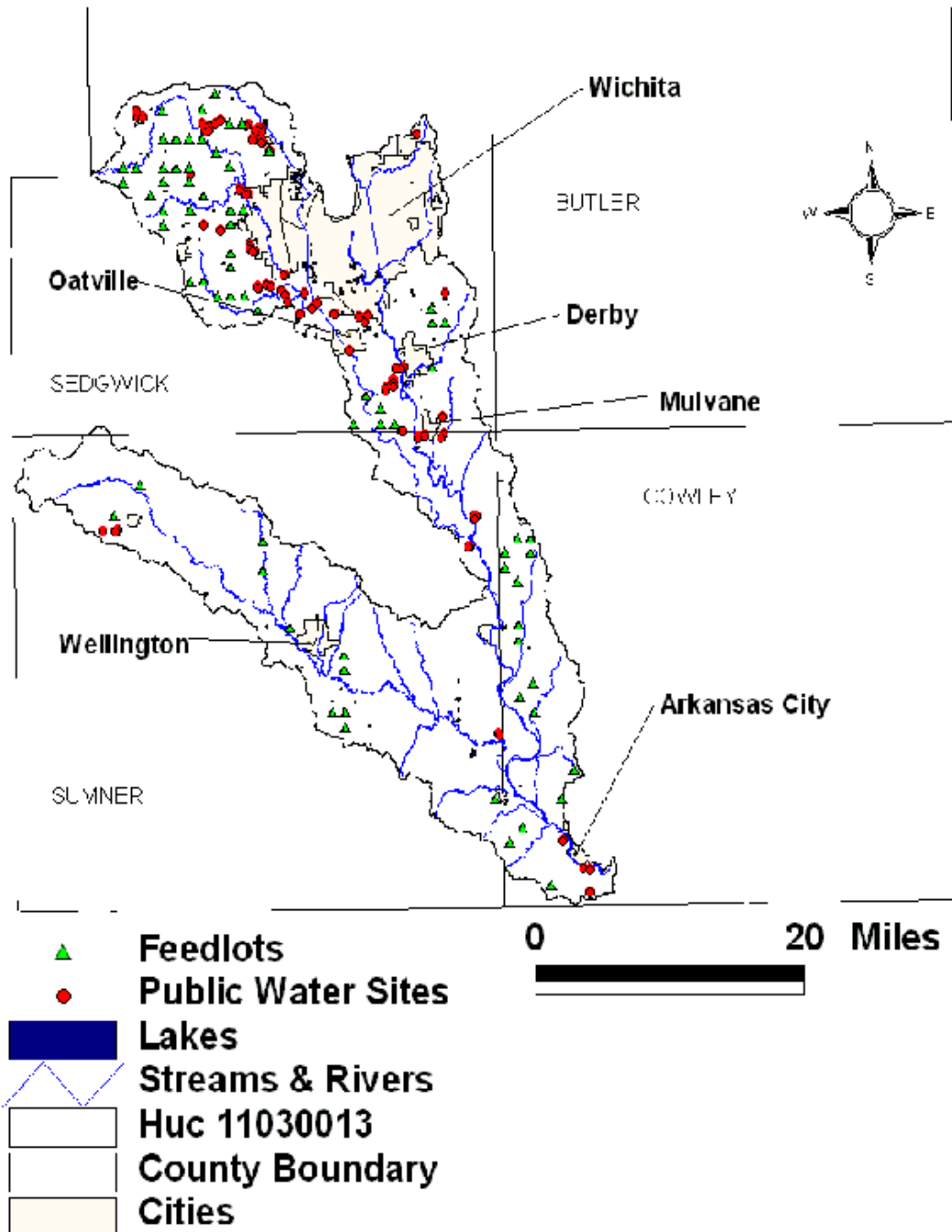


Figure 4: Middle Arkansas-Slate Watershed  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

The River City WRAPS watershed is generally defined by the limits of the City of Wichita, and includes a relatively small portion of the Middle Arkansas-Slate Watershed.

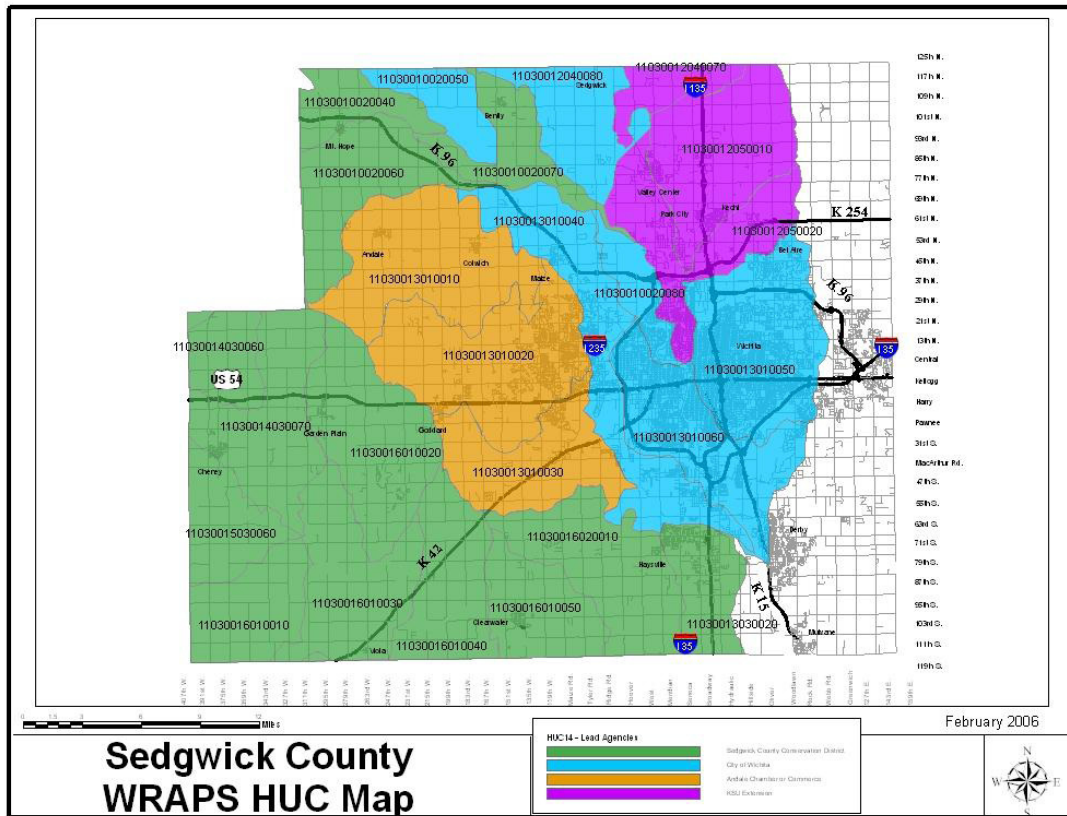


Figure 5: River City WRAPS Watershed  
From City of Wichita

## 2.1 SURFACE WATERS AND LAKE CHARACTERISTICS AND CONDITION

Designated uses for the watershed include primary contact recreation, domestic water supply, food procurement, groundwater recharge, industrial water supply, irrigation and livestock watering.

### Huc 11030013 Surface Water Uses

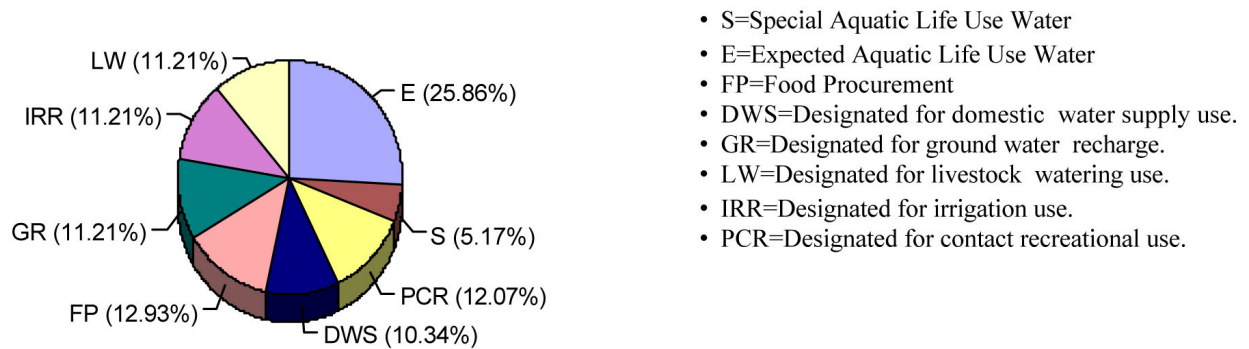


Figure 6: Surface Water Uses  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

### Huc 11030013 Lake Uses

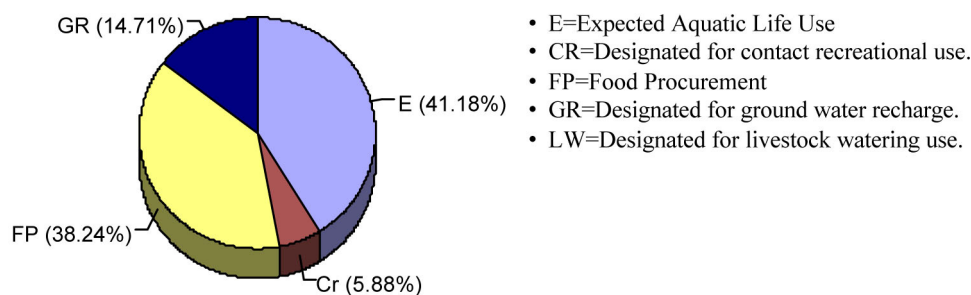


Figure 7: Lake Uses  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

According to the Watershed Conditions Report for HUC 8 11030013 (KDHE Non-point Source Section, 11/28/00), Surface water quality for Middle Arkansas-Slate streams and rivers is generally fair with less than half of surface water bodies not supporting their designated uses. The primary pollutant concern within the Middle Arkansas-Slate streams and rivers is fecal coliform bacteria (FCB). Additional pollutant concerns within the watershed include chlordane, chloride, sulfate and excess nutrients such as phosphate and nitrogen. Potential sources of contamination affecting the watershed include registered and unregistered feedlots, unrestricted livestock access to streams and rivers, wastewater treatment facilities, septic systems, wildlife, row crop agriculture and urban/suburban runoff.

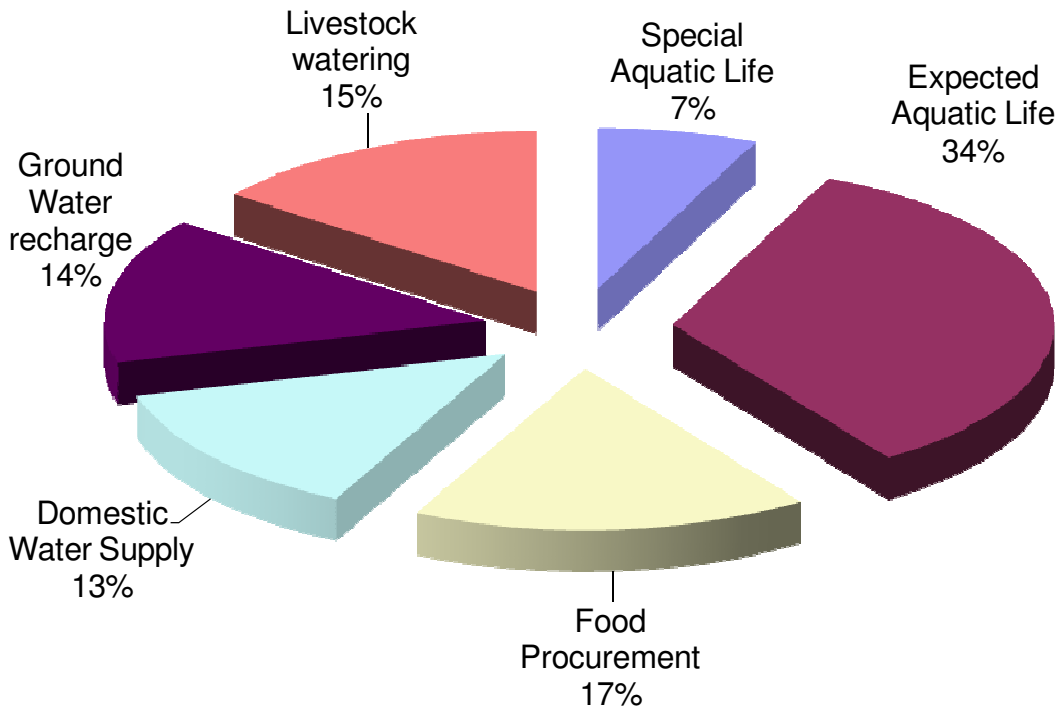


Figure 8: Designated Stream Usage  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

The primary pollutant concern in lakes and ponds within the watershed is eutrophication. Eutrophication is a natural process which is typically accelerated by excessive silt loading and high nutrient levels. Potential sources of contamination contributing to eutrophication include grazing land and urban runoff, land application of agricultural and municipal wastewater treatment byproducts, row crop agriculture and septic systems.

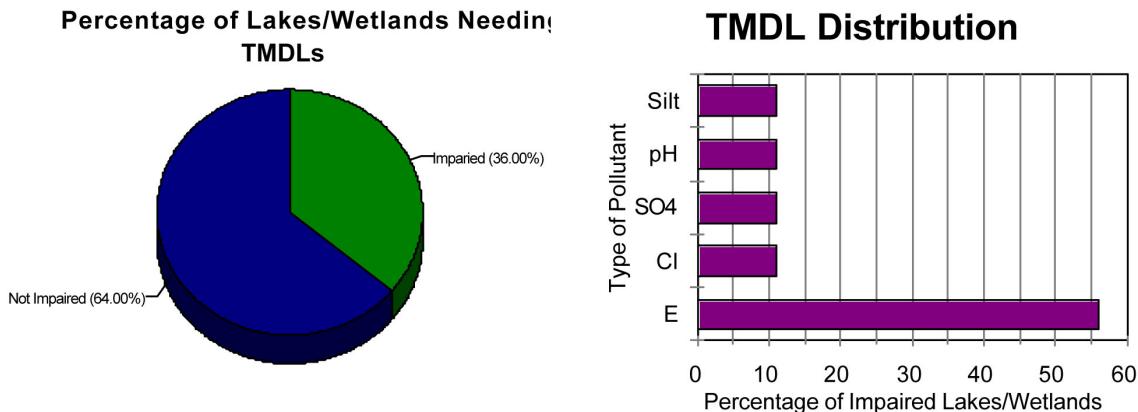


Figure 9: TMDLs  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

Analyzing land uses within the watershed provides insight to which land uses might have the greatest influence on the watershed and which potential contaminant sources are most likely to be significant within that watershed. Land use within the Middle Arkansas-Slate Watershed is predominantly agricultural in nature, with grassland comprising 73.4% of the area and row crop comprising 12.3 %. Urban area accounts for 11.5% of the land use.

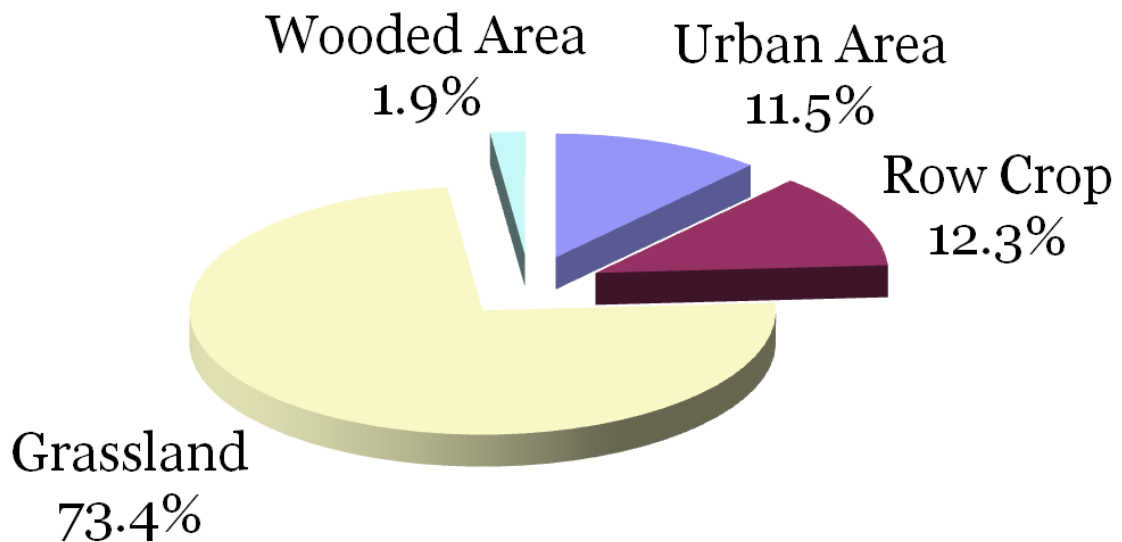


Figure 10: Land Use in Watershed  
Watershed Conditions Report for HUC 8 11030013 (Middle Arkansas -Slate), 2000

The River City WRAPS area accounts for the majority of the urban land use within the watershed. In the urban area of Wichita, surface runoff potential is greatly increased by the higher percentage of impervious surface area associated with urban commercial and residential development (Figure 10).

## 2.2 GROUNDWATER

Major groundwater aquifers underlying the watershed include portions of the High Plains Aquifer and alluvial aquifers of the Arkansas River and its tributaries. The High Plains Aquifer is limited to the northern portion of the watershed. Groundwater from this aquifer is frequently used for irrigation and livestock watering. Groundwater obtained from the High Plains Aquifer is typically hard to very hard; however, it is generally good quality, with no dominating pollutants. Alluvial aquifers occur throughout the Arkansas River valley and floodplains of its tributaries. These aquifers provide the primary water source for many public and private water supplies throughout the watershed. Alluvial groundwater quality is generally good. Nitrates, minerals, pesticides and bacteria can be pollutant concerns in some areas.

Two significant groundwater contamination areas are known to exist within the city limits of Wichita. These contamination areas have been identified as the Gilbert & Mosley and North Industrial Corridor (NIC) sites. Assessment and remediation activities are ongoing for both sites. Additionally, a number of smaller groundwater contamination plumes associated with leaking underground fuel storage tanks, industrial processes, gas and oil production, and uncontrolled release of materials have been identified and are in various stages of investigation and remediation.

More than 8,000 groundwater wells are located within the Middle Arkansas-Slate Watershed. The majority of these wells are used for domestic water supply or lawn and garden irrigation. More than 2,000 of these wells are identified as monitoring wells associated with groundwater contamination assessment and remediation. The City of Wichita has environmental use controls (EUCs) in place to regulate the installation and use of groundwater wells within the city limits.

### **2.3 SUB-WATERSHEDS**

The HUC 8 Middle Arkansas-Slate Watershed (HUC 11030013) is subdivided into a number of geographically smaller watersheds that drain minor creeks, streams and rivers located in and contributing to the larger watershed. These sub-watersheds are identified by 10 and 12 digit HUCs and by name. Larger numerical digit watersheds (HUC 10 or HUC 12) represent smaller geographic area watersheds that contribute drainage to the larger geographic area watershed (HUC 8).

As a part of the evaluation process, the stakeholder leadership team (SLT) identified the locations of surface water quality monitoring stations maintained by the KDHE and the City of Wichita. Using GPS data, the monitoring stations were located on aerial photographs to provide an overview of current land use, projected future land use and location relative to the River City WRAPS program.

Water quality impairment data for each monitoring point was presented. The SLT discussed potential sources of surface water quality impairments as indicated by land use and activity proximate to the monitoring points. Sub-watershed importance and value was determined based on the inferred significance of potential influence on the River City WRAPS watershed area.

Based on these criteria, six HUC 12 watersheds within the Middle Arkansas-Slate Watershed, one HUC 10 watershed in the Gar Peace Watershed (HUC 11030010) and one HUC 10 watershed in the Little Arkansas Watershed (HUC 11030012) were identified. These sub-watersheds include:

- Gypsum Creek (HUC 110300130101);
- Headwaters Cowskin Creek (HUC 110300130102);
- Cadillac Lake/Cowskin (HUC 110300130103);
- Dry Creek-Cowskin Creek (HUC 110300130104);
- Wichita Floodway (HUC 110300120105);
- Wichita Valley Center Floodway-Arkansas River (HUC 110300130106);
- Chisholm Creek-Little Arkansas (HUC 1103001205); and,
- Big Slough-Arkansas River (HUC 1103001002).



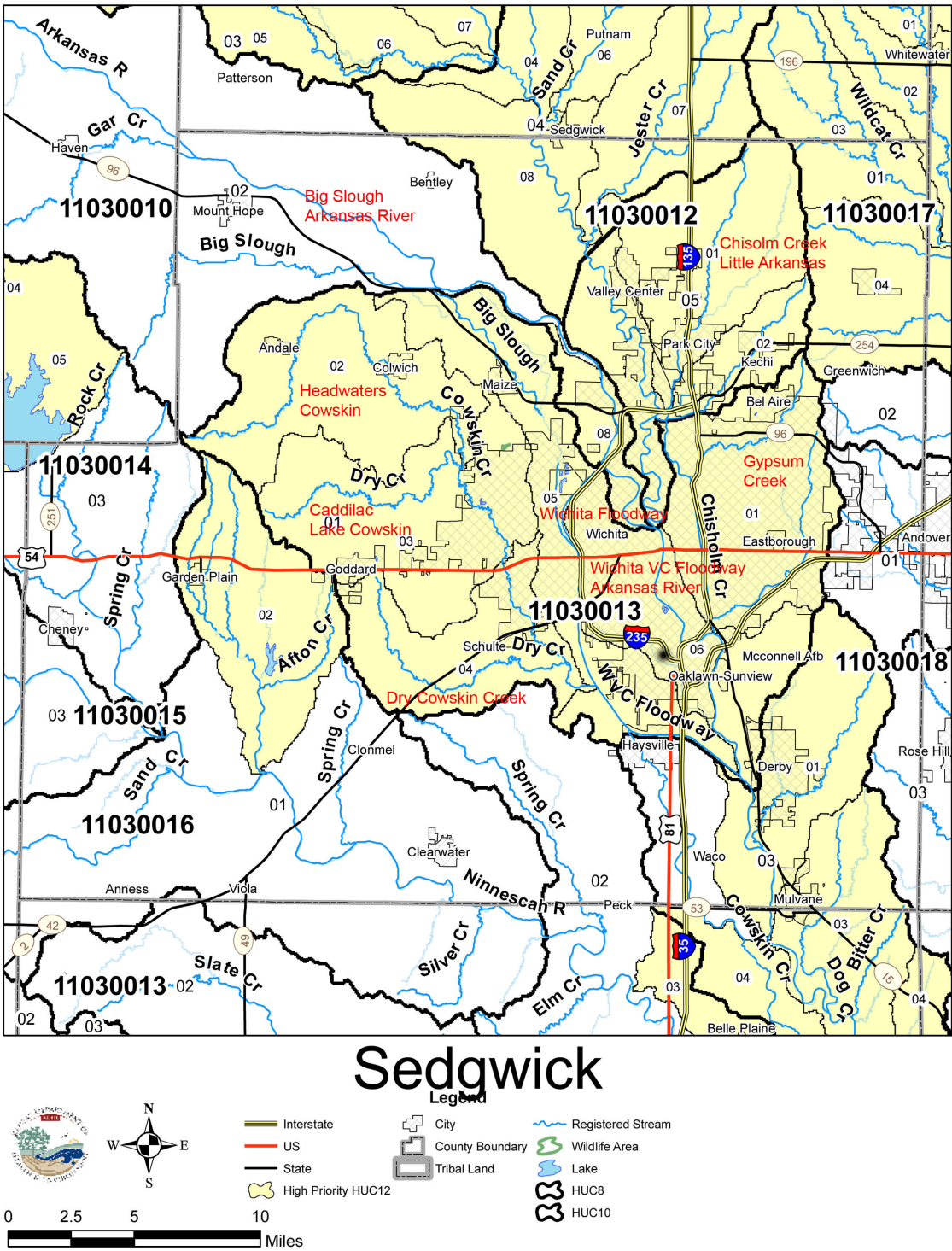


Figure 11: River City WRAPS Sub-watersheds

These sub-watersheds are considered high priority sub-watersheds relative to the River City WRAPS project for the following reasons:

1. All are tributaries of the Arkansas River and therefore, have a direct impact on surface water quality in the River City WRAPS area.
2. Surface water from each of the identified sub-watersheds drains to the Arkansas River within the boundaries of the River City WRAPS area.
3. Each of the identified sub-watersheds extends into the boundaries of the River City WRAPS area, or is contiguous with the River City WRAPS area.
4. Because of their contribution to water quality within the River City WRAPS area, these sub-watersheds must be considered to adequately assess, plan and implement strategies for the River City WRAPS program.

### **3.0 WATERSHED CONCERNS AND IMPAIRMENTS**

Designated uses for all watershed stem segments include Secondary Contact Recreation and Expected Aquatic Life Support. Designated uses for main stem watershed segments include Primary Contact Recreation, Domestic Water Supply, Food Procurement, Groundwater Recharge, Industrial Water Supply Use, Irrigation Use, and Livestock Watering Use.

Stakeholder survey information and comments received at public presentations indicated that the assigned designated uses were consistent with the expectations and watershed goals expressed by the stakeholder community.

#### **3.1 WATERSHED CONCERNS**

During the first meeting of the SLT, a round-table discussion was held to discuss watershed issues and concerns. The discussion was based on information obtained through surveys completed by stakeholders during community outreach efforts, personal knowledge of the watershed, website feedback, and input from homeowners associations, neighborhood associations, civic groups and professional organizations within the community.

The SLT identified the following watershed concerns and impairments that should be addressed through the WRAPS program. These concerns included:

- Litter and trash in rivers & streams interferes with recreational use, impairs water quality and decreases aesthetic value of the river corridor.
- Excessive run-off from impervious surfaces contributes to contamination, silt loading, and flooding problems.
- Contamination in runoff from parks, lawns, golf courses and athletic fields contributes to high nutrient loads, chemical contamination and eutrophication.
- Increased public awareness and education is needed to modify behaviors and actions that adversely affect the watershed.
- Lack of river access for recreational purposes affects public awareness of watershed conditions and limits understanding of the resource.
- Promotion of river use would be an effective tool to increase public awareness and improve perceptions of the watershed.



### 3.2 WATER QUALITY IMPAIRMENTS

The SLT reviewed and discussed existing surface water quality data obtained from the 2008 303(d) List of Impaired Waters, City of Wichita Storm Water Management, Middle Arkansas-Slate Watershed Conditions Report, 2009 Kansas Water Plan and reviewed summaries of Total Maximum Daily Loads (TMDLs) established for the watershed and sub-watersheds to evaluate known issues affecting the watershed.

Water quality impairments identified from the 2008 303(d) List of Impaired Waters and City of Wichita Storm Water Management fact sheets are summarized in the following table.

Ark @ 53rd					X	X			X
Little Ark @ 29th				X		X			X
Ark @ Seneca					X	X			X
Little Ark @ Wichita SC728	X	X	X	X					
Little Ark @ Central						X			X
Ark @ Hydraulic						X			X
Ark @ Wichita SC 729	X	X		X			X		
Ark @ 47th						X			X
Ark @ 63rd					X	X			X
Ark @ Derby SC281				X		X		X	
Ark @ Derby					X	X			X
Cowskin Cr @ Wichita SC730	X			X					
Cowskin Cr @ Wichita/VC floodway SC288		X							

Based on available information, public response to surveys and SLT discussion and knowledge, the following water quality impairments are targeted for action by the River City WRAPS program. Listed in order of priority, these impairments include:

1. Bacteria
2. Nitrate and phosphorus (nutrient loading)
3. Sediment loading
4. Pollutants associated with sediments (i.e. pesticide, fertilizers, and metals).

A number of TMDLs have been established for the watersheds identified as critical sub-watersheds within the River City WRAPS area. These TMDLs and their respective priority for implementation are:

- High implementation priority TMDLs;
  - Arkansas River below Wichita, Bacteria
  - Cowskin Creek, Biological
  - Cowskin Creek, Bacteria.

- Medium implementation priority TMDLs;
  - Arkansas River below Wichita, Biological
  - Arkansas River below Wichita, Chloride
- Low implementation priority TMDLs;
  - Arkansas River below Wichita, Chlordane
  - Arkansas River at Wichita, Chlordane

Horseshoe Lake and Kids Pond, Sedgwick County Park, have been assigned low priority TMDLs for eutrophication.

The SLT has agreed that the goal of the WRAPS project will be to meet designated use criteria for all segments of the watershed. Meeting the applicable TMDLs established by KDHE is critical to achieving this goal. The SLT also recognizes that water resources that without assigned TMDLs may be “threatened” by pollution and may become degraded in the future if no action is taken. The protection of water resources that currently meet designated use water quality standards was also considered.

### **3.3 POTENTIAL SOURCES OF IMPAIRMENT**

Applicable TMDL documents consistently identified surface water run-off conditions and excessive soil erosion as significant contributing factors relative to TMDL excursions recorded at monitoring points. With this consideration in mind, the SLT reviewed aerial photographs indicating the locations of surface water quality monitoring points to identify predominant land use potentially affecting water quality near the monitoring points.

The SLT identified the following potential sources or surface water quality impairments:

- Bacteria: Registered and unregistered feedlots, pet waste, wildlife, failing on-site wastewater treatment systems, municipal wastewater treatment systems, leaking sanitary sewer lines.
- Nitrate and Phosphorous loading: Run-off from feedlots, improper or excessive use of fertilizers for private lawns, golf courses and athletic fields, improper management of pet waste, discharge of lawn and garden waste to storm sewers and streams.
- Sediment Loading: Agricultural activities, construction activities, run-off from streets and roads, erosion of unprotected land surfaces, accelerated stream channel and bank erosion attributed to increased run-off from impervious surfaces.
- Pollutants such as pesticides, insecticides and metals.

### **3.4 POTENTIAL WRAPS ACTIONS TO ADDRESS IMPAIRMENTS**

Through round-table discussion, review of technical documents and consultation with local and state water quality professionals, the SLT identified a number of potential actions to address water quality impairments that were identified as priorities within the watershed. Several potential actions not directly addressing water quality were

evaluated based on their potential for information/educational value, increased public awareness, enhanced recreational opportunities and aesthetic value. The SLT recognizes that these factors play an important role in development of public support of the WRAPS project.

These potential actions were evaluated using a decision matrix. Each proposed action was assigned a score based on the following criteria,

- Water Quality Improvement potential
- Economic Impact potential
- Flood Control potential
- Recreational Opportunity potential
- Information / Educational value
- Creativity or uniqueness of the project

Using the decision matrix, each of the identified criteria were assigned values ranging from 1 to 4. Projects that would have significant impact or exceptionally improve the criteria were given a value of 4. Projects that would have an impact or noticeably improve a criteria were given a value of 3, Projects that would have minor impact or result in minor improvements to the criteria were given a value of 2 and those projects with negligible or no impact or improvement were given a value of 1. The assigned values for each criterion were totaled to provide a score for each proposed project. The score was used to rank proposed projects for prioritization. The Summary Scores and subsequent rankings are shown below.

Summary Decision Matrix		
Proposed Action	Mean Score	Rank
Rain Gardens	16	1
Vegetated Buffers along drainage ways	15	2
Pervious Pavement	15	2
River Access improvement	14	3
Bioswales	14	4
Water Taxi Project	14	5
River Clean-up Projects	14	6
Riparian Restoration and Enhancement	14	7
Working with Homeowner and Neighborhood Associations	13	8
Social Networking: Twitter, Facebook, Web Page	13	9
River Beautification Projects	9	10

### 3.5 CURRENT AND ONGOING PROJECTS WITHIN THE WATERSHED

A number of past, current and ongoing projects were identified as relevant to the River City WRAPS program. A brief summary of the objectives and activities for these projects follows.

The City of Wichita has worked for several years sampling and improving Arkansas River water quality within the City. Beginning in 2000 with an Arkansas River Symposium, the City formed two Arkansas River Committees - one focused on the technical aspects of the river water quality and the other on information and education efforts. These committees remain active, with representatives serving on the WRAPS SLT and provide a resource for public information and educational opportunities.

In 2004, the City embarked on a Visioneering Plan that included a focus on the Arkansas River. This Visioneering Plan included a goal to "clean-up the river". In the last several years, Wichita has initiated major and significant economic development projects along the downtown river corridor. Two recent projects, Wichita Waterwalk and the Wichita River Corridor Access projects are currently in progress with additional projects being considered. A new downtown Arena-Convention Center has recently been completed as a part of this redevelopment initiative. This program provides a venue for promoting the WRAPS program and is a resource for continued community outreach efforts.

The City has aggressively studied bacteriological impacts to the river that would affect the health of river users. The City's Water and Sewer Department has made the following efforts:

- Water and Sewer has plans to, or has completed, elimination or replacement of two sewer lines crossing the Little Arkansas River - one at Nims Street and one at 15th Street.
- Water and Sewer conducts cross-connection investigations and leak detection on a regular basis. The Department has replaced one 36 inch sewer line discovered to be leaking into Chisholm Creek and eliminated illegal discharge of sewage to storm drain systems where detected.
- The Department conducts television inspections on 500,000 feet of sanitary sewer each year and conducts smoke tests on another 30,000 feet of sewer annually.
- The Department of Environmental Services is conducting studies of approximately 4,000 areas within the City that still rely on septic systems for treatment of domestic sewage.

These programs are an important source of existing information relative to the assessment of current watershed conditions and evaluation of watershed restoration and protection strategies.

The City's Parks and Pathways Master Plan (1996) include plans to prepare an Arkansas River Master Plan for recreational use of the river corridor through Sedgwick County. This plan would include acquiring or creating lands with significant water or natural landscape features for park and recreation corridor development, re-evaluate use of a dam on the Arkansas River for greater water depths between Lincoln Street and Watson Park. The objective of the plan is to enhance recreational opportunities and use of the Arkansas River. This initiative provides opportunities for the development and implementation of project demonstrations, informational watershed tours and increased public awareness of watershed issues.

The Wichita/Sedgwick County Stormwater Advisory Committee has developed a stormwater BMP manual and revised stormwater ordinances for the Wichita/Sedgwick County area. The SLT has denitrified stormwater run-off as a significant factor affecting

water quality in the watershed. Continued cooperative efforts with the Wichita Stormwater Management Division are important to the success of the WRAPS project.

Wichita Initiative to Renew the Environment (WIRE) is a community-based initiative led by the University of Kansas School of Medicine-Wichita. It is a grassroots initiative in collaboration with citizens, neighborhood groups, community leaders, businesses, and government to identify environmental health concerns and work toward improving our local community. WIRE areas of interest include air quality, land use and development, water quality, and solid waste issues. The WIRE project has developed considerable information relative to public opinions and perceptions on water quality issues and is considered a valuable resource.

#### **4.0 ASSESSMENT PROJECT PLAN**

The goal of a WRAPS Assessment Project is to characterize watershed conditions, identify needs and opportunities, and understand how the watershed responds to various management scenarios. The estimated time required for completion of the Assessment Phase is eighteen months.

##### **4.1 CONTINUED INFORMATION AND EDUCATION: \$18,500.00**

Continued stakeholder education and involvement are important components of the Assessment Project, particularly in an urban setting with a large and diverse population. The SLT plans to meet this objective by development of informational meetings/workshops, tours, demonstration projects, utilization of social networking opportunities such as Twitter and Facebook and maintaining and expanding the current WRAPS website to provide public access to up-to-date information regarding WRAPS projects, programs and status and to make it a more proactive format. Continued community outreach to involve Homeowners Associations and Neighborhood Associations may be included to increase public awareness and identify their role in the WRAPS process.

Sponsorship of activities such as river clean-up days, adopt a stream projects and storm drain stenciling have been discussed as means of maintaining may be projects of public interest and involvement and to increase public awareness. However, the focus of this budget item is to utilize an electronic information and education program to publicize these activities and to recruit new and younger members to the WRAPS process.

##### **4.2 ESTABLISH ASSESSMENT CRITERIA: \$7,500.00**

The stated goal of the WRAPS project is to meet or exceed water quality standards for the assigned watershed segment designated uses. Progress toward achieving this goal will be measured against established TMDLs applicable to the watershed.

##### **4.3 INVENTORY: \$63,500.00**

Designated uses for the watersheds included in the WRAPS area include Primary and Secondary Contact Recreation, Expected Aquatic Life Support, Domestic Water Supply, Food Procurement, Groundwater Recharge, Industrial Water Supply Use, Irrigation Use, and Livestock Watering Use. Assessing or inventorying the condition of water resources involves consideration of the designated or beneficial uses of water resources.

Water resources that do not meet the water quality standard for their designated use are considered impaired and are subject to established TMDLs. TMDLs are specific to a water resource and the designated use, identifying the maximum of various pollutants

that the water resource can receive and still meet water quality standards. Many TMDLs establish goals for pollutant load reductions necessary to restore an impaired water resource.

Assessing (or inventorying) the condition of the watershed will include:

- Evaluation of existing or initiating new biological surveys and inventories by the Kansas Biological Survey, Kansas Department of Wildlife & Parks, U.S. Fish and Wildlife Service, or other technical assistance providers,
- Utilization of known data with respect to fish populations and species (biological criteria) as a monitoring guidepost for future projects.
- Evaluation of existing water quality data developed by the City of Wichita relative to bacteriological impacts to the river that would affect the health of river users, cross-connection studies conducted by the Water and Sewer Department and inventories of on-site domestic water disposal and treatment systems within the watershed,
- Evaluation of existing hydrologic studies, storm water quality data, and other pertinent information developed by Storm Water Management,
- Evaluation of common practices associated with lawn and garden maintenance, disposal of yard waste and other organic materials affecting nutrient loading, sources of sediment loading and other non-point source factors affecting the watershed. This evaluation would be accomplished through surveys of Neighborhood Associations and Homeowners Associations.
- Evaluation of stream segments currently meeting water quality standards that may be in need of protective strategies to prevent contamination in the future.
- Continued surface water monitoring activities to provide up to date water quality data to assist in the selection and prioritization of implementation phase activities, evaluate the effectiveness of demonstration projects and identify problem areas.
- Investigation and development of methods to evaluate community outreach efforts to determine the most effective ways to increase public awareness and participation in the WRAPS process.
- Continued surface water monitoring activities to provide up to date water quality data to assist in the selection and prioritization of implementation phase activities, evaluate the effectiveness of demonstration projects and identify problem areas.
- Investigation and development of methods to evaluate community outreach efforts to determine the most effective ways to increase public awareness and participation in the WRAPS process.
- Evaluate hydrologic information to identify areas within the watershed that experience surface water run-off and flooding problems.
- Identify and map impervious surface area within the watershed to facilitate selection and prioritization of BMP pilot projects and prioritize areas for BMP demonstration projects and implementation.

- Identify and map areas within the watershed utilizing on-site domestic wastewater disposal systems.
- Conduct small-scale demonstration projects, river clean-up projects. and
- Conduct public awareness campaigns to increase public interest and participation, maintain enthusiasm for the WRAPS project and evaluate project feasibility.

#### **4.4 IDENTIFY NEEDS AND OPPORTUNITIES: \$25,500.00**

The established goal of the WRAPS project is to meet water quality standards for the following watershed designated uses.

- Secondary Contact Recreation and Expected Aquatic Life Support - all watershed stem segments
- Primary Contact Recreation, Domestic Water Supply, Food Procurement, Groundwater Recharge, Industrial Water Supply Use, Irrigation Use, and Livestock Watering Use - main stem watershed segments.

The WRAPS project proposes to meet applicable designated use water quality by achieving established TMDLs for Fecal Coliform Bacteria, Biological / Nutrient Loads, Sediment Loading and other pollutants. The SLT has determined that the following actions will provide the most effective approach to achieving established TMDLs.

- Implementation of effective information/educational programs with the goal of increasing public awareness and participation.
- Implementation of effective best management practices (BMPs) to reduce surface water run-off.
- Implementation of effective BMPs to improve surface water run-off quality and reduce erosion and sediment loading.
- Implementation of projects and initiatives directed at improving recreational opportunities and aesthetic values along rivers and streams in the watershed.

The proposed projects were combined into the following categories,

**Information and Educational initiatives:** Working with Homeowners and Neighborhood Associations, Twitter, Facebook and Webpage development,

**Surface water run-off and water quality initiatives:** Rain Gardens, Vegetated Buffers, Pervious Pavement, Bioswales, River Cleanups, Riparian Restoration and Enhancement,

**Improved recreational and aesthetic initiatives:** Water Taxi Project, River Access, River Beautification, River Clean-ups.

Some stream segments within the watershed currently meet applicable water quality standards and represent opportunities for application of BMPs that are protective of water quality standards. The WRAPS SLT has determined that the proposed actions would serve to protect these unimpaired waters from future degradation.

#### **4.5 DEVELOPMENT OF WATERSHED MODELS: \$12,500.00**

Models are used in watershed assessment, planning and implementation projects to estimate the impacts of watershed management actions. A model as used in the context of watershed management is a description or analogy used to help visualize something that cannot be directly observed.

At this time, the WRAPS SLT plans include development of simple watershed models that will aid in understanding the hydrology and storm water discharge characteristics of the watershed. This information will be utilized to identify problem areas within the watershed and to prioritize planning and implementation strategies. Examples of planned modeling projects include:

- Modeling storm water discharge to identify watershed segments contributing high contaminant loads to the main watershed.
- Mapping storm water run-off to identify high priority locations for application of BMPs related to increased infiltration or run-off control.
- Identification and mapping of areas with a high ratio of impervious to pervious surfaces to identify high priority areas for implementation of green roof technologies, pervious pavement projects and rain gardens.

As the assessment project progresses, the need may arise for more complex and detailed modeling. Professional assistance may be required for extensive and complex modeling projects.

#### **4.6 PREPARING A WATERSHED ASSESSMENT PROJECT REPORT: \$7,500.00**

Assessment projects may require a substantial amount of technical assistance, depending on the extent of inventories and the development of watershed models. Professional assistance may be required to facilitate completion of the Assessment Project Report.

Total estimated \$127,500